THE DELAWARE AND HUDSON COMPANY BULLETIN

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WILMINGTON NOTCH
NEAR LAKE PLACID, N.Y.

“the D&H”

FEBRUARY 15, 1927

1732

Washington

1799

By HARRIET MONROE*

WHEN dreaming kings, at odds with swift-paced time,
Would strike that banner down,
A nobler knight than ever writ or rhyme
With fame's bright wreath did crown
Through armed hosts bore it till it floated high
Beyond the clouds, a light that cannot die!
Ah, hero of a younger race!
Great builder of a temple new!
Ruler, who sought no lordly place?
Warrior, who sheathed the sword he drew!
Lover of men, who saw afar
A world unmarred by want or war,
Who knew the path, and yet forbore
To tread, till all men should implore;
Who saw the light, and led the way
Where the gray world might greet the day!
Father and leader, prophet sure,
Whose will in vast works shall endure,
How shall we praise him on this day of days,
Great son of fame who has no need of praise?

How shall we praise him? Open wide the doors
Of the fair temples whose broad base he laid.
Through its white halls a shadowy cavalcade
Of heroes moves o'er resounding floors —
Men whose brawned arms raised those columns high,
And reared the towers that vanish in the sky,—
The strong who, having wrought, can never die.

*(*From the "Commemoration Ode"— World's Columbian Exposition, Chicago, October 21, 1892.)*

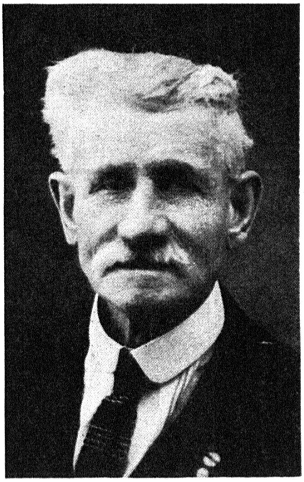
"the D&H" The DELAWARE AND HUDSON COMPANY "the D&H"
BULLETIN
Vol. 7 Albany, N. Y., February 15, 1927 No. 4

Always A Boon Companion

Binghamton Yard Lost One of Its "Landmarks" With the Retirement of Jerry C. Broat, Whose Long Career Was Passed Within Its Confines

IT is somewhat different now, of course. Time has a happy faculty of causing us to forget sorrow and disappointment, else we might ever be overwhelmed by our feelings. But back early in 1922—it was on March 1 to be exact—there was sadness in the yard at Binghamton, that touched the heart of every train service man, every crossing flagman, every track hand, every Mechanical department worker and those people employed in the wholesale houses and factories served by our sidetracks.

And there was reason aplenty for their sorrow, for it was then that they bid farewell to a companion as jolly and well met as any that had ever shared their joys and trials, their confidences and their esteem. He was a "landmark" in the Binghamton yard. For forty years and eleven months he had been employed there, without an interruption of more than a day or two. And so they swallowed a lump of sadness as they parted company with Jerry C. Broat, yard conductor, who, also, was downcast with remorse at the thought of leaving his many friends of long standing. It was quite a while before everyone got accustomed to Jerry's absence and for many a day, and many a week, Jerry, too, missed his comrades, but the sting of the parting has been somewhat alleviated with the passing of the years since his retirement.



JERRY C. BROAT

It was rheumatism that compelled him to quit the profession of his choice, a work that to this day fascinates him as it did years and years ago, and all along down the stretch of his long career. He was eight months past his sixty-seventh birthday, it is true, but nothing short of a physical handicap could have enforced that parting. Today, however, he is much the same Jerry as of old. Five more years have been piled upon his shoulders, but he carries them well. His rheumatism is gone, or nearly so, and he is ready to go back drumming an engine if some one only will dare him to. Here's what he actually does say: "I'll go up on the gable of a house with the next one, any day," and judging from his spryness and quick motions we wouldn't bet one cent against him, despite his handicap of something more than seventy-two years.

Jerry came with the Company under Charles Wadsworth, agent at Binghamton, on April 1, 1881, as a freight handler on the old transfer platform over which Fred Rock, foreman, was in charge. Between forty and fifty men were then employed on the platform as all Company cars arriving at Binghamton were unloaded, providing, of course, their contents could be handled by men. No cars were allowed to leave the road, except in rare cases. The transfer between railroads—the Erie and the Delaware, Lackawanna and Western—was made by team, Ned Garvey being the truckman engaged the greater part of the time.

Next he became a "number grabber" at the old freight house in Eldridge street, opposite McMann's Wagon Works. The yard wasn't much to speak of—one main track with two switches at one side and one at the other, leading to tracks that would hold about thirty-five cars of the size then in use. Lead seals of the horseshoe style were used and the practice of taking seal records was much the same as it is today.

Quickly did he acquire the rudiments of railroad work for on August 1, 1885, he was appointed night yardmaster, with an office in the freight house. Incidently, it was he who secured the first yard office in Binghamton, a small building, about ten by twelve, that stood for some years between the main track and the roundhouse at Liberty street. When the present yard office was occupied, this building was moved to the rear of the roundhouse and used as a boiler room.

In that day the "job" of being a yardmaster was different from what it is today. With only one locomotive and two men to do the switching it frequently became necessary for him to go out and throw switches or ride cars in order to get the work done. He had a clerk, but no operator; and he is pleased to recall that one of his clerks was none other than H. C. BECKER, now the agent at Binghamton.

Tiring of yard and night work, he turned to braking and made his first trip over the road to Oneonta with John Mangan. On his next trip Tommy Vanaman was his conductor. JERRY didn't know the road very well at this time and after leaving the tunnel, going north, he failed to apply the brakes as quickly as he should have and, as a result, rode a runaway train into Nineveh before it could be brought to a stop. On the way the train, made up with link and pin, broke into three parts. That ride he will never forget, so thrilling was it. Vanaman, however, was satisfied with his "green" brakeman and never entered a complaint against him.

A few trips over the road, which covered practically his entire absence from the yard during his more than forty years of service, and he went back "drumming" an engine and later became night yardmaster again, this time under P. F. SHEA, now assistant superintendent on the Susquehanna division. It was against orders to fly or stake cars in those days, but he declares that more of it was done than is the case today. On one occasion he nearly ran down C. D. Hammond, then superintendent, when flying a car. He explains his predicament by saying that he failed to see Mr. Hammond until after the car was started on its way. Dismissal stared him in the face, he thought, but Mr. Hammond never mentioned the incident.

He is a native of Wayne county, Pennsylvania, having been born at Equinunk, fourth youngest in a family of twelve children of the late William Broat, a farmer and lumberman. His schooling was limited to that obtainable in "a little red school house," and as soon as he was physically able to do so he took his place in the woods or fields, along with his father. In 1874, he went to Windsor, N. Y., where for seven years he was engaged in farm work, part of the time with his brother-in-law, William West. He went to Binghamton during March, 1881, to visit relatives and while there caught the "railroad fever" with the consequences that have been enumerated and which but partially cover such an active career as was his.

His wife was Miss Laura West of West Windsor, N. Y., and to them five children were born, three of whom are living. She died eleven years ago and since that time he has resided with a son at No. 247 Oak Street, Binghamton He is a member of Parlor City lodge, No. 36, Brotherhood of Railroad Trainmen, and of The Delaware and Hudson Veterans' Association.

Tallest Smokestack

THE tallest smokestack in the world is situated at Port Defiance, on the shore of Puget Sound, about six miles from the city of Tacoma, Wash. It is 572 feet 10 inches in height, measuring from the top of the foundation. It serves to carry away the fumes from the Tacoma smelter of the American Smelting and Refining Company. At the top the giant smokestack is twenty-four feet and at the bottom forty feet in diameter. It is built of paving brick, each brick being four by three and a half by eight and a half inches in dimensions. The foundation is made of 5,000 cubic yards of concrete reinforced by 120 tons of rail, each rail weighing sixty pounds.

Railroad Club Dinner

Supervisory Officers on the Pennsylvania Division Mark First Anniversary of Their Club With Get-Together In Which They Are Joined By Company Officials

THERE is a greater community of interest and good fellowship among railroad folk today than ever before. A somewhat bold statement this, in face of what our veterans are wont to tell us of the "good old days," now past and gone, but it is nevertheless true. Scarcely a week passes, nowdays, but that it is marked by some activity sponsored by our employe family that fully confirms this belief.

Great, But Considerate

WASHINGTON, great as he was, never forgot the rights and happiness of others. Once he was detained at one of his colonel's tents all night, accepting the invitation after first having been assured that there was plenty of bedding and blankets for all. Primus, the negro orderly, thereupon made up two modest beds and the officers retired, while he continued at his tasks. When he was satisfied that they were asleep, he crawled upon a box to get what rest he might. Washington, however, was yet awake.

"Primus," said he, "Primus!"

The orderly started up and rubbed his eyes. "What, General?" he inquired.

"What do you mean by saying you had straw and blankets enough?" asked Washington. "Here you have given up your blankets and straw to me, that I may sleep comfortably, while you are obliged to sit through the night."

"It's nothing, General," replied Primus," "it's nothing! I'm well enough! No matter about me, I sleep very good."

"But it is matter, it is matter," declared Washington. "I cannot do it, Primus. If either is to sit up, I will. But I think there is no need of either sitting up. The blanket is wide enough for two. Come lie down with me."

"Oh, no, General!" implored Primus. "No, let me sit here."'

"I say come and lie down!" urged Washington. "There is room for both; I insist upon it."

Thereupon Washington threw open the blanket and moved to one side of the straw and though Primus was exceedingly shocked at the idea, he obeyed. And so the great General and the lowly negro servant slept until morning.

We are thinking now, in particular, of the First Annual Dinner and Dance of The Delaware and Hudson Railroad Club—Pennsylvania division, which was held on Wednesday evening, January 18. The membership of the club is composed entirely of the supervisory officers of every department on the division, banded together for social and educational purposes, i. e., that they may meet on regular occasions and, by study and discussion of one another's problems, become better acquainted to the end that a healthy spirit of coöperation and good fellowship may obtain. Surely, only words of commendation may be spoken in behalf of such an organization.

The "get-together" was held in the Crystal ballroom of the Hotel Casey in Scranton, beginning at 6:30 p. m. Sometime earlier, however, the members, accompanied by their wives or daughters, or lady friends perhaps, and invited guests, began to arrive and continued to join the party until, at last, it numbered no less than 250. The mezzanine floor outside the ballroom presented a scene, meanwhile, not soon to be forgotten. Here high officials in the employ of the Company mingled in happy accord with those of lower rank—really, as a matter of fact, rank and station passed entirely from the minds of all in face of the cordiality that prevailed. Not one thing, not a single incident, served to detract from the spirit of the occasion.

At 7 o'clock, the doors opened and the party filed into the great ballroom, made beautiful by the myriads of cut glass pendants that adorn the great chandeliers and upon which the strong rays of numberless incandescent lamps played bewitchingly. Tables accommodating groups of almost any size from four to eight or ten, were quickly occupied, as was the speakers' table set lengthwise of and at one side of the room. At the opposite side, Earl Keating's Ramblers already were prepared to add their bit to the wholesome merriment then running at high tide.

When all had been seated, the toastmaster,

N. S. Burns, rules examiner, called for the singing of "America," following which the invocation was offered by the Rev. J. A. O'Neill, curate of St. Rose's church of Carbondale. He then welcomed the members and their guests, and declared that everyone appeared well satisfied "not just with what was on the tables but with the good fellowship then so apparent." Briefly, he recalled the organization of the club, just a year earlier, and told of its aims and its accomplishments to date.

Meanwhile, the waiters had stood in readiness to serve the splendid menu an outline of which had been found in the neat program that, together with a Hallowe'en cap of a bright hue, had come into the possession of each person as they were seated and for some time had been tempting appetites. It consisted of fruit cocktail, celery hearts, olives, cream of tomatoes, saltines, filet of sole, tartar sauce, Casey dinner rolls, roasted stuffed turkey, cranberry sauce, mashed potatoes, green peas, D. & H. salad, French vanilla ice cream, assorted cakes and coffee. Each dish had been prepared with culinary expertness, as its quality proved, and the service was of the same fine order.

During the dinner hour, Jack Walsh of Wilkes-Barre, in the role of song leader, kept the diners busy, between bites, singing popular songs, old and new, and introduced the novelty of calling upon some member of the party to lead in the singing of each. In doing this, he revealed many artists hitherto unknown. He concluded his part of the program with a comedy sketch in which he became the partner of Con McCole of Wilkes-Barre, a humorist whose ability is known far and wide, who later caused all to hold their sides while they laughed away his impersonations.

The formal part of the program was quite brief. Depending upon the same versatility that has won for him an enviable record as a toastmaster, **Mr. Burns** introduced, in turn, the three speakers of the evening—**H. F. Burch**, assistant general manager; **F. L. Hanlon**, supervisor of wage and working agreements; and **Colonel J. T. Loree**, vice-president and general manager. Then, when **Colonel Loree** had finished his talk, in which he had cited three thought-provoking subjects, i. e., the profitable employment of leisure time, the loss in per capita wealth, and the wide extension of credit for non-productive purchases, the floor was cleared and dancing became the entertainment and continued as such until 1 a. m.

The dinner and dance committee, headed by **Mr. Burns**, and to the members of which unstinted praise is due for the excellent arrangements and the capable manner in which the affair was handled, included, also, **D. J. Buckley**, division accountant, in charge of ticket sales; **J. W. Howard**, divisional car foreman, in charge of the entertainment; **M. J. McDonough**, division engineer, in charge of the dance floor; and **H. N. Atherton**, general yardmaster at Green Ridge, and **J. J. Brennan**, master mechanic, who received the members and guests.

C. A. Morgan, superintendent, is president of the club; **M. F. Clune**, trainmaster, vice-president; **D. J. Buckley**, division accountant, secretary; **J. J. Brennan**, master mechanic, treasurer; and **F. W. Lewis**, chief clerk to the division superintendent, financial secretary. Members of the executive committee include these officers and **M. J. McDonough**, division engineer; **J. W. Howard**, divisional car foreman; and **H. L. Symonds**, road foreman of engines.

Modern Youth

It should be clear by this time that the fast going youth of today does not need more control through government action, but it is very evident that he does need a change in home life. A new spirit has developed in America since the World War, a spirit of restlessness, of resistance to constituted authority, often of lawlessness where the individual is not in full accord with the law. This spirit is not confined to youth. It is more evident in his elders.

The new spirit in youth is a general revolt against the admonitions of his elders. But age is not setting youth a sober example to follow. Age has been showing a disrespect for law. All this has had its effect on youth.

The youth sees his parents, although not obeying the law themselves, laying down the law for their son. Without respect for the law themselves, parents cannot expect their children to adopt a proper attitude towards law, either parental or governmental. Lack of respect for parental authority undermines school discipline, without which education cannot function, and respect for constituted authority in general.

It behooves the average father to put himself in order first if he would improve the condition of his modern son. Youth is highly impressionable, highly imitative. It might be found advisable to furnish him with an example worthy of imitation.—*Philadelphia Bulletin.*

Life is short, so improve each minute.

Troy Bridge Before Being Remodeled

Bridge Problem Uniquely Solved

Conversion of Fixed Truss to a Lift Span Meets Government's Requirements at Troy, N. Y., and Effects Saving In Cost of Transformation

By JAMES MACMARTIN, *Chief Engineer*

IN order to comply with the Government's requirements on a bridge at Troy, N. Y., over the Hudson River, The Delaware and Hudson recently completed an interesting piece of bridge reconstruction work, wherein an existing fixed span was converted into a lift span at about two-thirds the cost necessary for any other suitable arrangement. The structure upon which this work was done is a combined railroad, street car and highway bridge between Troy and the village of Green Island, N. Y., and on the line of the Rensselaer and Saratoga Railroad operated under lease by The Delaware and Hudson. The new lift span gives a clearance of 135 feet above lowest low water and an unobstructed opening of slightly over 170 feet.

The original bridge was built in wood in the year 1852. There had been, previous to that, a bridge crossing the stream in this locality, which was finished in 1836 or 1838, and across which cars were drawn by horses, but engines hauling trains were not used until the reconstruction of this first bridge in 1852, as above stated. The bridge was burned down in 1862 and immediately rebuilt. In the year 1876, the three most westerly spans were rebuilt in iron, and in the year 1884, the five easterly spans were rebuilt in iron, and in such rebuilding, the design was of three-truss, through lattice spans, carrying a double-track railroad, and a highway, over which a trolley now operates, and called for four fixed spans, 184 feet out to out of iron, and one rim-bearing, swing span, 192 feet out to out of iron. The distance center to center of railroad trusses was 26 feet, and the distance center of middle truss to center of highway truss, 21 feet 6 inches. The swing span was so located that it gave a channel between the dock wall and the most westerly pier, of only about 56 feet, the pivot pier being located on the land side of the river dock wall.

Since the opening of the Barge canal in 1915, the river traffic using this channel has increased materially, both as to the number of boats using the channel and their size, and the situation was made worse by the Government allowing the filling in of the most westerly fixed span, and part of the one next to it, by creating a new bulk head line. This, of course, increased the current through the draw, at times of high water, and made it more difficult for navigation. The result was that in 1922 the government ordered the building of a new channel span which would give not less than 150 feet of unobstructed channel, specifying that there should be not less than 135 feet of clear height above lowest low water in the redesigning, if the design was to be a lift bridge.

The greater part of the river traffic passing through this bridge required even at the highest

(Continued on Page 59)

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The heights by great men reached and kept
Were not attained by sudden flight,
But they, while their companions slept,
Were toiling upward in the night.
—LONGFELLOW.

Creatures of Habit

WE are all creatures of habit. If you don't believe so, just carry your watch in your right vest pocket instead of the southpaw side, and see how often you will dive into the erstwhile pocket when you want to know the time.

"Habit is a cable, we weave a thread of it every day until it becomes so strong we cannot break it." Such being the issue that confronts us mortals, it behooves us to develop the right line of habits, instead of those that bring disappointments, embarrassments, and possibly failure.

Get the habit of thrift, which means nothing more than spending a little less than is earned.

Get the habit of looking on the bright side, and not the dark side. There is nothing like pessimism to create gloom and to lower one's value of his day's job.

Get the habit for having a place for everything and everything in its place.

Get the habit of working with and together, with your business or trade associates. Teamwork wins the game. Of course, we all want the house or the firm we are associated with to be successful.

Get the habit of silence, if unable to speak well of others. To do otherwise is sure to prove a boomerang.

Get the habit of "Stop, Look and Listen" when danger lurks. It is better to be safe than sorry.

Practice makes perfect, and with good habits well learned, it will be found that the right thing will be done automatically. Like the engineer on the fast flying train, when seeing possible danger ahead, instead of wondering what he should do, he automatically does the right thing and we reach our destination safe and sound.—*The Keystone Butler.*

Efficiency Is the Key

BY now railroad workers quite generally appreciate just what efficiency means to Management and to themselves. It means exactly this and nothing more: that were Management to cease striving for efficiency in operation its prosperity as well as that of its employe family would be at an end. Due to competition and other conditions rates apparently have reached a fixed level for the time being at least, while over mounting costs of material and equipment used by the railroads, and of taxes, Management has no control whatsoever. Its one avenue of escape from possible disaster is through its ability and disposition to develop maximum efficiency in operation. This development is dependent in no mean sense upon employe coöperation, and employes may well consider this their responsibility to Management.

According to Carl W. Ackerman the American public will spend seventy billion dollars in 1927, and our three biggest jobs as a consequence, he declares, will be to increase production and distribution; to decide what we will buy with our spendable income, and, to save more than we did last year. This means that everyone will have to work harder this year unless everyone can work more efficiently.

The railroads, in order to effect an efficient distribution of raw materials and merchandise, according to his estimate, will have to move more than 9,000 miles of freight cars every week. That's our job and the more efficiently we handle it the greater will be the returns. Let's do the job well.

There are moments in life that are never forgot
Which brighten, and brighten, as time steals away;
They give a new charm to the happiest lot,
And they shine on the gloom of the loneliest day.
These moments are hallowed by smiles and by tears
The first look of love and the last parting given.
—PENROD.

The Lost Palace

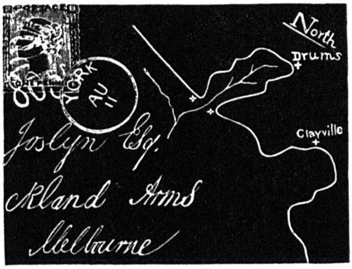
Edward Everett Hale Herein Explains the Weird Plans of Two Early Railroaders To Avoid A Circuitous Loop of Track by Leaping Locomotives Across Its Neck

(Continued from Last Issue.)

TODHUNTER was my palace conductor. One night he was full, and his palace was hot, and smelled bad of whale-oil. We did not burn petroleum then. Well, it was a splendid fall moon in August; and we were coming down grade, making the time we had lost at the Brentford Junction. Seventy miles an hour she ran if she ran one. Todhunter had brought his cigar out on the tender, and was sitting by me. Good Lord! it seems like last week.

"Todhunter says to me, 'Joslyn,' says he, 'what's the use of crooking all round these valleys, when it would be so easy to go across?'

"You see, we were just beginning to crook round, so as to make that long bend there is at Chamoguin; but right across the valley we could see the stern lights of Fisher's train; it was not more than half a mile away, but we should run eleven miles before we came there."



I knew what Mr. Joslyn meant. To cross the mountain ranges by rail, the engineers are obliged to wind up one side of a valley, and then, boldly crossing the head of the ravine on a high arch, to wind up the other side still, so that perhaps half an hour's journey is consumed, while not a mile of real distance is made. Joslyn took out his pencil, and on the back of an envelope drew a little sketch of the country; which, as it happened, I still preserve, and which, with his comments, explains his whole story completely. "Here we are," said he. "This black line is the Great Alleghanian,—double track, seventy pounds to the yard; no figuring off there, I tell you. This was a good straight run, down grade a hundred and seventy-two feet on the mile. There, where I make this X, we came on the Chamoguin Valley, and turned short, nearly north. So we ran wriggling about till Drums here, where we stopped if they showed lanterns,—what we call a flag-station. But there we got across the valley, and worked south again to this other X, which was, as I say, not five-eighths of a mile from this X above, though it had taken us eleven miles to get there."

He had said it was not more than half a mile; but this half-mile grew to five-eighths as he became more accurate and serious.

"Well," said he, now resuming the thread of his story, "it was Todhunter put it into my head. He owns he did. Todhunter says, says he, 'Joslyn, what's the use of crooking round all these valleys, when it would be so easy to go across?'

"Well, sir, I saw it then, as clear as I see it now. When that trip was done, I had two days to myself,—one was Sunday,—and Todhunter had the same; and he came round to my house. His wife knew mine, and we liked them. Well, we fell talking about it; and I got down the Cyclopædia, and we found out there about the speed of cannon-balls, and the direction they had to give them. You know this was only talk then; we never thought what would come of it; but very curious it all was."

And here Mr. Joslyn went into a long mathematical talk, with which I will not harass the reader, perfectly sure, from other experiments which I have tried with other readers, that this reader would skip it all if it were written down. Stated very briefly, it amounted to this: In the old-fashioned experiments of those days, a cannon-ball traveled four thousand and one hundred feet in nine seconds. Now, Joslyn was convinced, like every other engineman I ever talked to, that on a steep down-grade he could drive a train at the rate of a hundred miles an hour. This is thirteen hundred and fourteen feet in nine seconds,—almost exactly one-third of the cannon-ball's velocity. At those rates, if the valley at Chamoguin were really but five-eighths of a mile wide, the cannon-ball would cross it in seven or eight seconds, and the train in about twenty-three seconds. Both Todhunter and Joslyn were good enough mechanics and machinists to know that the rate for thirty-three hundred feet, the width of the valley, was not quite the same as that for four thousand feet; for which, in their book, they had the calculations and formulas; but they also knew that the difference was to their advantage, or the advantage of the bold experiment which had occurred to both of them when Todhunter had made on the tender his very critical suggestion.

The reader has already conceived the idea of this experiment. These rash men were wondering already whether it were not possible to leap an engine flying over the Chamoguin ravine, as Eclipse or Flying Childers might have leaped the brook at the bottom of it. Joslyn believed implicitly, as I found in talk with him, the received statement of conversation, that Eclipse, at a single bound, sprang forty feet. "If Eclipse, who weighed perhaps one thousand two hundred, would spring forty feet, could not my train, weighing two hundred tons, spring a hundred times as far?" asked he triumphantly. At least, he said that he said this to Todhunter. They went into more careful studies of projectiles, to see if it could or could not.

The article on "Gunnery" gave them just one of those convenient tables which are the blessing of wise men and learned men, and which lead half-trained men to their ruin. They found that for their "range," which was, as they supposed, eleven hundred yards, the elevation of a forty-two pounder was one degree and a third; of a nine-pounder, three degrees. The elevation for a railway train, alas! no man had calculated. But this had occurred to both of them from the beginning. In descending the grade, at the spot where, on his little map, Joslyn made the more westerly X, they were more than eleven hundred feet above the spot where he had made his second, or easterly X. All this descent was to the advantage of the experiment. A gunner would have said that the first X "commanded" the second X, and that a battery there would inevitably silence a battery at the point below.

"We need not figure on it," said Todhunter, as Mrs. Joslyn called them in to supper. "If we did, we should make a mistake. Give me your papers. When I go up, Monday night, I'll give them to my brother Bill. I shall pass him at Faber's Mills. He has studied all these things, of course; and he will like the fun of making it out for us." So they sat down to Mrs. Joslyn's waffles; and, but for Bill Todhunter, this story would never have been told to me, nor would John Joslyn and "this woman" ever have gone to Australia.

But Bill Todhunter was one of those acute men of whom the new civilization of this country is raising thousands every year; who, in the midst of hard hand-work, and a daily duty which to collegians, and to the ignorant men among their professors, seems repulsive, carry on careful scientific study, read the best results of the latest inquiry, manage to bring together a first-rate library of reference, never spend a cent for liquor or tobacco, never waste an hour at a circus or a ball, but make their wives happy by sitting all the evening, "figuring," one side of the table, while the wife is hemming napkins on the other. All of a sudden, when such a man is wanted, he steps out, and bridges the Gulf of Bothnia; and people wonder, who forget that for two centuries and a half the foresighted men and women of this country have been building up, * * * a system of popular education, improving every hour.

At this moment Bill Todhunter was foreman of Repair Section No. 11 on the "Great Alleghanian,"—a position which needed a man of first-rate promptness, of great resource, of good education in engineering. Such a man had the "Great Alleghanian" found in him, by good luck; and they had promoted him to their hardest-worked and best-paid section,—the section on which, as it happened, was this Chamoguin run, and the long bend which I have described, by which the road "headed" that stream.

The younger Todhunter did meet his brother at Faber's Mills, where the repair-train had hauled out of the way of the express, and where the express took wood. The brothers always looked for each other on such occasions; and Bill promised to examine the paper which Joslyn had carefully written out, and which his brother brought to him.

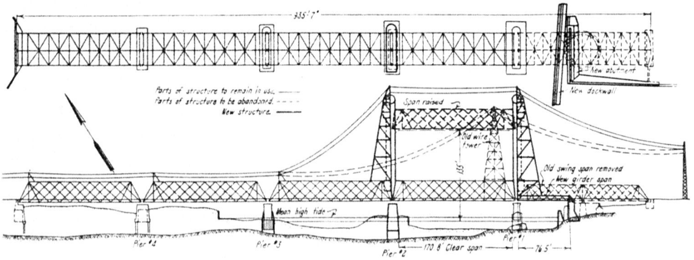
I have never repeated in detail the mass of calculations which Bill Todhunter made on the suggestion thus given to him. If I had, I would not repeat them here, for a reason which has been suggested already. He became fascinated with the problem presented to him Stated in the language of the craft, it was this:

(Concluded on Page 62)

Bridge Problem Uniquely Solved

(Continued from Page 55)

navigable stage of the river, an additional clearance above the lower chords of not more than 10 feet. So it was decided to place a lift span, rather than a swing span, as the latter would require the full opening of the span, even though the additional height required were but a foot or two, whereas the lift span would require only the actual additional height needed, and would be quicker of operation. The order of the Government fixed the new channel which was to be not less than 150 feet in width between piers 1 and 2. Negotiations were begun with Harrington, Howard & Ash, consulting engineers, Kansas City, Mo., to see whether it would not be possible to use the span then in place as a lift span, it being of sufficient strength to carry the heaviest power used by the railroad, and the condition of the metal being such that it was good for many more years of service. After final decision had been made that it was entirely practical to use the present fixed span as a lift span, detailed plans of the reconstruction were made, and the contracts were let, both for the substructure and the super-structure. The adopted design gave a structure consisting of three fixed spans, the converted lift span and a through girder span over the old channel opening. The old swing span was to be eliminated and an embankment built up to carry the tracks between the old swing span abutment and the new abutment for the through girder span.



Drawing Showing Relation of the New Work to the Old Structure

It would seem that wherever the ordinary lift required is not more than in this structure, that is, from 2 to 10 feet, the lift span would give better results than the swing span. As a matter of fact, since the bridge has been in operation, that is since April 1, 1925, it has not been necessary, with one exception, to raise it to exceed 10 feet for the passing of any vessel, the exception being a dredge which it was desired to bring above the bridge to work in the river. This required some 25 feet of raise. The occasions when it is necessary to raise the bridge to its full height, or give a clearance of 135 feet above lowest low water will be very infrequent. The Government required 135 feet clearance above lowest low water originally. It was afterwards stated that permission would be granted us to erect the towers so that they would give 108 feet of clearance, provided that we add the additional 27 feet at the Government's order It was thought best to build the structure for the full lift originally, and this was done.

The Government also required that there should be 14 feet of channel depth below lowest low water and this necessitated changes in piers 1, 2 and 3. Pier 1 was founded on rock consisting of Hudson river shale at a depth of about 10 feet below lowest low water and it was necessary to encase this pier in concrete to below the new channel depth. Pier 2 being founded on wooden cribs at practically low water, it was necessary to entirely rebuild it. In doing this it was found that the rock under this pier varied from a depth of 17 feet below lowest low water on the south or down-stream end, to a depth of 48 feet at the up-stream end. It was decided to drive a steel cofferdam around the entire pier and found the reconstructed pier on rock, carrying the ends of the two spans on falsework during the tearing down of the old pier, the excavation, and the rebuilding of the new pier. The Government order further required that the 14-foot channel should extend to the westerly edge of pier 3. As this pier was founded on piles cut off at low water, it was necessary to protect the foundations of this pier so that the channel could be so carried. This was done by encasing it in concrete in a way similar to that employed on pier 1.

The sub-structure work was let to the Great Lakes Dredge & Dock Company, and was completed in June, 1924. The super-structure was let to the American Bridge Company, and this company began the construction of the same in the summer of 1924, by raising the entire structure 8 inches, this also being a part of the Government's order, although we could never understand what the need was for this 8-inch raise of the fixed structure, except that it was desired to have a clear height under the bridge, of not less than 30 feet above lowest low water, the old bridge being 29 feet 4 inches above that datum. This was followed by the erection of the westerly tower and by the changes necessary to convert the fixed span to a lift span. These latter changes consisted essentially of the addition of vertical lifting columns, riveted to special lifting plates which were in turn inserted in and riveted to the end posts of each truss. The lifting columns were surmounted by a lifting girder which was tied back to the upper chord of each truss by struts. The design was such that the lifting force was applied directly over the end bearings of the span. The channel legs of the towers were supported by special castings which were carried on the end bearing plates of the fixed span on the west and of the new through girder span on the east. The back legs of the towers were carried on the top chords of the fixed trusses and on the top of the through girders when they were placed.

Of course, navigation had to be carried on during reconstruction, and nothing could be done toward tearing down the old draw span, the placing of the through girder span between pier 1, and the new Troy abutment, and toward the construction of the tower on that girder span, until the close of navigation in 1924. As navigation did not close until the middle of December, this was the rush part of the job, and on account of it being carried on during the winter weather when there were many days that the men could not work on the tower, this part of the work was the most difficult. It was, however, carried on successfully and the bridge was opened for navigation on April 1, 1925.

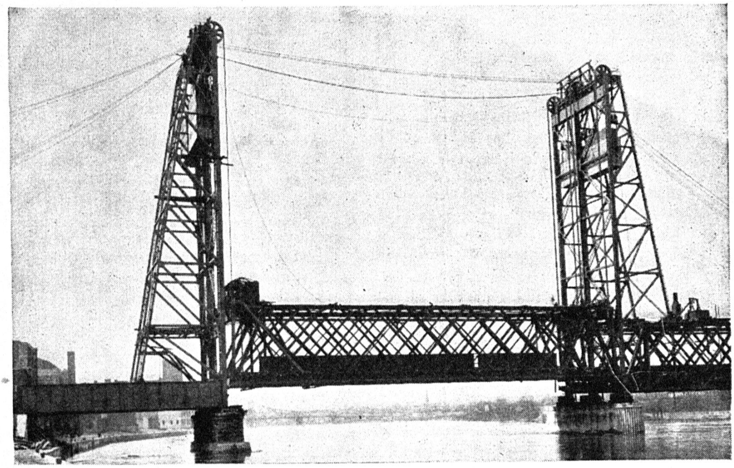
Following the close of navigation the floor system of the old swing span over the draw was supported by falsework, the corresponding section of the old trusses being then burned away and removed. Up to this point all work had been carried on under traffic. The through girders were placed in position on a Sunday during which time the bridge was out of service for traffic for a period of about four hours. The new abutment intersected the ring wall of the old pivot pier and in order to eliminate possible extended delays it was decided to leave the ring wall in place and bring the abutment up to it on each side, bonding the concrete to it on the inside and outside. As a further aid to the solidity of the structure, a part of the section between the new dock wall and the pivot pier was filled with concrete. As a part of this work the section between the new abutment for the through girder span and the old inland abutment of the draw span was filled in and the remaining section of the trusses were removed.

The new steel work consisted of the two towers, with the necessary lift girders, and the through girder span on the east side of the lift span, together with cables, machinery, counterweights, et cetera. The counterweights consist of approximately 681 tons of concrete blocks, or about 330 tons on the west end of the span, and 351 on the east end, the additional twenty-one tons being due to the operating house, and additional machinery located on the east end of the lift span. These counterweights are carried by thirty-two cables, on either end of the span, varying from 1½ to 1¾ inches, according to their position. The cables at either end are carried over four sheaves at the top of the tower in groups of eight. After the counterweights were placed, it was found that the bridge was very nearly in balance, and it was only necessary to add a few additional blocks, space for which had been provided in the steel box designed for this purpose, and placed on the top of the counterweights.

The operating power for the lift span is electricity with an auxiliary gas engine for use in case of the non-supply of current, the equipment consisting of two 85 h.p. General Electric motors, and a 25 h.p. Buda gas engine. The estimated travel of the bridge, using the electric motors, was from 48 to 50 feet per minute, and it was found on trial that this requirement had been met. There was erected a total of 1,817,100 pounds of material as follows: 852,400 pounds in the towers, lift girders, bracing, etc.; in the girder span, 387,800 pounds; in machinery, sheaves, cables, etc., 286,600 pounds; and in the material added to the existing span, 290,300 pounds.

It was necessary to rearrange the interlocking signals protecting the draw span, and in doing this it was decided to install color light signals, with desk circuit controllers using storage battery floated on power line for operation of relays, chart lights and locks. The color light signals used 110 volt a. c. current, the circuit being arranged so that if the bulb burned out the electric lock controlling the bridge lock lever would not release. A three lever, style "D" interlocking machine is located in the tower on the lift span, two levers operating bolt locks and bridge circuit controllers, and one lever mechanically interlocked with the other two levers, requiring reversing before bolt locks can be removed on the draw span. Attached to this lever is an electric lock, which cannot be unlocked until all signals protecting the draw span are in the stop position. To provide for an emergency, a hand screw time release requiring two minutes' time, is provided in the tower and is connected so that all signals must be in the stop position before releasing the lock lever in the interlocking machine.

Illuminated chart, desk circuit controllers controlling the signals, and locks are located on the fixed span next to the draw span, with an attendant on the ground. When it is desired to lift the bridge, the operator in the tower notifies the attendant on the ground who operates the desk circuit controllers, putting all signals in the stop position. When this has been done he releases the electric lock on the lock lever in the operator's tower allowing him to unlock the bridge locks. When the bridge is lowered it requires the bridge locks in place and levers normal in the tower and locked before the signals can indicate proceed.



Finished! Note the "lift" span, slightly raised

If

(With apologies to whomsoever they are due)

IF you can leave loved ones without protection,
Yet strut around and think you are a man;
If you behold your trusting wife and children,
Yet nothing certain for their future plan.
If you can risk all things upon your living,
Not caring what may happen, should you die;
Oh, I want to tell you, tell you truly, brother,
Your living and your loving is a lie.

If you're content to carry no protection
For the loved ones that you claim to hold most dear;
Oh, man, there is something wrong about you,
If you can go your way and never fear.
If fraternal friends and earnest neighbors tell you
That you can easily protect your kith and kin;
Yet you care not, and will not give heed to them,
You're a bigger fool than I am, Gunga Din.

—From the *Sovereign Visitor.*

The Lost Palace

(Continued from Page 58)

"Given a moving body, with a velocity eight thousand eight hundred feet in a minute, what should be its elevation that it may fall eleven hundred feet in the transit of five-eighths of a mile?" He had not only to work up the parabola, comparatively simple, but he had to allow for the resistance of the air, on the supposition of a calm, according to the really admirable formulas of Robins and Coulomb, which were the best he had access to. Joslyn brought me one day a letter from Bill Todhunter, which shows how carefully he went into this intricate inquiry.

Unfortunately for them all, it took possession of this spirited and accomplished young man. You see, he not only had the mathematical ability for the calculation of the fatal curve, but, as had been ordered without any effort of his, he was in precisely the situation of the whole world for trying in practice his own great experiment. At each of the two XX of Joslyn's map, the company had, as it happened, switches for repair-trains or wood-trains. Had it not, Bill Todhunter had ample power to make them.

For the "experiment," all that was necessary was, that under the pretext of readjusting these switches, he should lay out that at the upper X so that it should run, on the exact grade which he required, to the western edge of the ravine, in a line which should be the direct continuation of the long, straight run with which the little map begins.

An engine, then, running down that grade at the immense rapidity practicable there, would take the switch with its full speed, would fly the ravine at precisely the proper slopes, and, if the switch had been rightly aligned, would land on the similar switch at the lower X. It would come down exactly right on the track, as you sit precisely on a chair when you know exactly how high it is.

"If." And why should it not be rightly aligned, if Bill Todhunter himself aligned it? This he was well disposed to do. He also would align the lower switch, that at the lower X, that it might receive into its willing embrace the engine on its arrival.

(To be concluded in Next Issue.)

Mike, who was advancing rapidly in his work, was stopped by the foreman one day who said: "Mike, you are doing fine, I am going to raise your wages."

Mike, all excited, said: "No, no, no, be jabbers no. I lose enough now when I'm off a day."—*Contributed.*

Railroadin'

WHEN the engines are a-puffin', and the coal they are a-stuffin'
In the fire-box to make steam;
When half the folks are a-fussin', and the other half are a cussin',
And the whistles all begin to blow and scream;
When half the folks are a-hustlin', and the other half a-bustlin',
And the bosses all a-jumpin' up and down;
When the 'phones are a-ringing, and the wires are all a-singing,
And business rollin' in from all around:
Don't get mad and jump and holler, or lay on the ground and wallow
Even though you think everything is explodin';
'Cause when things are all a-hummin', and the trains by tens a-comin',
You ain't doin' nothin' but railroadin'.

When you think you can't stand the gaff, that's the time to up and laff,
And holler, "Shoot 'em at me, kid! Let's go!"
Don't stand around a-yellin', for I know there ain't no tellin'
How business will pick up in a day or so.
Though the clouds are black as thunder, and you mistake and blunder,
It'll all come out in the wash, you bet.
So stick right down to it; don't say you can't, but do it,
Even though they find you drowned in your sweat;
Though with dirt and dust it fills you, and you work until it kills you—
Around the Golden Gates they are a-headin'
Lot's of peace and long rest; for I know they're keepin' the best
For the men who down here are railroadin'.

—G. M. Bee, in *N. & W. Magazine.*

Artificial Limb Business Booms

HAVE a care! The artificial limb industry is booming. Figures submitted by 123 manufacturers for 1925 and recently given out by the Department of Commerce, show that the production of artificial limbs in the United States rose to a total value of $2,787,392 in that year, an increase over 1923 of 13 per cent according to the biennial census of manufacturers. Pennsylvania with fifteen and New York with thirteen lead all other states in this industry.

Train Resistance Experiments

IN his book on "The Resistance of Express Trains," Denby Marshall says:

"The first experiments on train resistance seem to have been made by George Stephenson and Nicholas Wood on the Killingworth Railway in 1818.

"The first dynamometer car used on the Great Western Railway, and probably the first one in the world, was constructed at Swinden by the late Sir Daniel Gooch."

Clicks from the Rails

Thriving Employes' Credit Union

At the close of its fiscal year, October 31, last, the Boston and Maine Railroad Employees' Credit Union had 1,630 shareholders, holding 28,788 shares of a total value of $150,975.97. This represented an increase for the year of 125 shareholders and 6,303 shares of $29,649.87 paid up value. The Union declared its usual dividend of 8 per cent, and, in consequence, distributed $9,202.58 among its shareholders, an increase of $2,148.25 over the previous year.

The Credit Union in common with other banks in the state is supervised by a bank commission in exactly the same way as are savings banks. Its primary object is to promote thrift among its members and to provide a medium by which they may save money in small amounts and obtain loans at reasonable rates of interest. Shares have a par value of five dollars and payments are arranged to suit the convenience and pocketbooks of the employes.

* * *

Wins Second Harriman Medal

For the second consecutive year the Union Pacific System has been awarded the E. H. Harriman Gold Medal by the American Museum of Safety, for having made the best record among the railroads of our country in accident prevention work. The silver replica was awarded to the Duluth, Missabe and Northern Railroad as having done the best safety work among roads operating between 1,000,000 and 10,000,000 locomotive miles, and the bronze replica went to the Green Bay and Western Railroad for the most conspicuous example of successful accident prevention work among roads operating under 1,000,000 locomotive miles during one year.

* * *

Pay $709,950 Insurance Benefits

Group Insurance benefits of $709,950.48, approximately three quarters of a million of dollars, were paid to employes of the General Electric Company at its Schenectady Works, or their beneficiaries, during the year just ended, 1926.

Trainmen Make Unique Appeal

Here's a new idea! Members of the Brotherhood of Railway Trainmen employed by the Missouri, Kansas and Texas Lines and residing in Denison, Texas, sensing that their continued employment, as well as improved conditions of employment, is entirely dependent upon the patronage of the public, which the "Katy" serves, sent Denison merchants this Thanksgiving letter:

"To the Merchants of Denison:

"American citizens observe the custom handed down from the days of the Pilgrim Fathers, of being thankful, and have set aside Thursday, November 25th, for the purpose of rendering thanks to Almighty God for their benefactions.

"There are many reasons why we are thankful this year of 1926. We have enjoyed health and prosperity, and as merchants of Denison you have patronized the Missouri-Kansas-Texas Railway by whom we are employed, you have supported the Company by travel and by shipping, which has reacted to the benefit of the employes by furnishing them employment. We solicit your continued patronage; which will serve to insure the same employment for us in the future.

"There are approximately three hundred members of the Brotherhood of Railroad Trainmen employed by the Missouri-Kansas-Texas Railroad Company, living in Denison who patronize Denison merchants, and we all trust that the coming year will bring to you and yours many good things, both material and spiritual, and that the next Thanksgiving day will find all with more abundant reasons for being thankful."

* * *

The Nancy Hanks

Because of its remarkable record-breaking run, a train operated between Atlanta and Savanah, Ga., in 1893, was named after a fleet race horse, Nancy Hanks. The distance of 294 miles between the two cities was covered in each direction in six hours and forty-five minutes, including a stop of fifteen minutes at Macon. The equipment consisted of a baggage car, two passenger coaches and a parlor car, hauled by three large compound engines.

Missouri Pacific Veterans Organize

Organization of a Veterans' Association on the Missouri Pacific Railroad is progressing in a way that is most encouraging to its promoters. Eligibility is based on forty years of aggregate service. For pensioned employes the number of years they have been carried on the pension rolls may be added to those of active service. The membership fee is one dollar and annual dues are one dollar, also.

Gold pins bearing the official emblem of the association, just adopted, are being distributed among the members. The seal in the center is red and the band on which appears "Veterans' Association" is blue. The lettering and remaining portions of the pin are gold.

* * *

Turn River From Its Course

No longer does Mother Earth thwart railroad engineers. They recognize no obstacle. Down at Port Clinton, Pa., on the main line of the Reading, they recently changed the course of the Schuylkill river in order to avoid enlarging a 1,650-foot brick-lined tunnel through solid rock and the renewal of two large steel bridges. The changing of the course of the river for a distance of approximately 2,000 feet involved the digging of a new river channel about 1,200 feet long and 210 feet wide. This made possible the relocation of the main tracks and the abandonment of the tunnel and bridges. The improvement cost in the neighborhood of $500,000.

* * *

Parlor Car Travel Increases

Despite the loud and vehement demand that Congress take steps to abolish the Pullman "surcharge," the *Railway Age*, in a recent editorial, shows that while the earnings of the railways from the day coach business are steadily declining, travel in sleeping and parlor cars to which the so-called "surcharge" applies is rapidly increasing. Travel in day coaches declined 22 per cent between 1921 and 1925, while travel in sleeping and parlor cars increased 22 per cent in spite of the "surcharge."

Team-Work

TODAY all things worth while are accomplished by team-work. Unless you are a team-worker, you are little likely to succeed under modern conditions. Few can accomplish anything alone, unaided. Civilization is built on team-work — is team-work. All trade, all commerce, all industry sprang from team-work — unified effort of thought, actions, resources and capital.

A man to be a team-worker must be every inch a man. He is ready to give and take. He is a diplomat. He does not expect to have everything his own way. He is broad enough to try to see things from the other person's point of view. He is accommodating, obliging and helpful. He co-operates. He plays the game fair. Every man should be a team-worker. There is no half-way mark. Either you are or you are not. One hundred per cent team-work will pay one hundred per cent dividends.

— Curtis Service.